THERMAL UNIT PRINTER MECHANISM

TUP492-24

SPECIFICATION AND OPERATION MANUAL

STAR MICRONICS CO., LTD.

NOTICE

- All rights reserved. Reproduction of any part of this manual in any form whatsoever, without STAR's express permission is forbidden.
- The contents of this manual are subject to change without notice.
- All efforts have been made to ensure the accuracy of the contents of this manual at the time of going to press. However, should any errors be detected, STAR would greatly appreciate being informed of them.
- The above notwithstanding, STAR can assume no responsibility for any errors in this manual.

©Copyright 1998 Star Micronics Co., LTD.

CONTENTS

1. GENERAL DESCRIPTION 1
2. CONSTRUCTION 2
2.1 Configuration 2
2.2 Principle of Operation 2
3. GENERAL SPECIFICATIONS 4
4. PAPER ROLL SPECIFICATIONS 5
5. PRINTER SETTINGS 7
5.1 Switches and Buttons 7
5.2 Setting the DIP Switches 8
5.3 Setting the EEPROM 10
6. DISPLAYS AND FUNCTIONS 12
6.1 LEDs 12
6.2 RESUME Button 12
6.3 Power Switch and Button Combinations 12
6.4 Sensor Adjusting Mode 13
6.5 Near-End Sensor 13
6.6 Error Messages 14
6.7 Near-End Sensor Position 16
7. INTERFACE 17
7.1 Serial Interface (RS-232C or RS-422A) 17
7.2 Parallel Interface 19
8. CUTTER 20
9. PRESENTER 21
10. CHARACTERS 22
10.1 Character Set 22
10.2 Characters and Sizes 22
11. POWER REQUIREMENTS 23
12. NOISE 25
13. STANDARDS 25
14. RELIABILITY 26
14.1 During operation 26
14.2 During storage 26
14.3 Allowable Static Electricity Level 27
14.4 Vibration Test 27
14.5 Drop Test 27
14.6 Life Test 28
15. INSTALLING THE PAPER ROLL 29
16. INSTALLATION 31
16.1 Installation precautions 32
16.2 Other precautions 32
17. MAINTENANCE 36

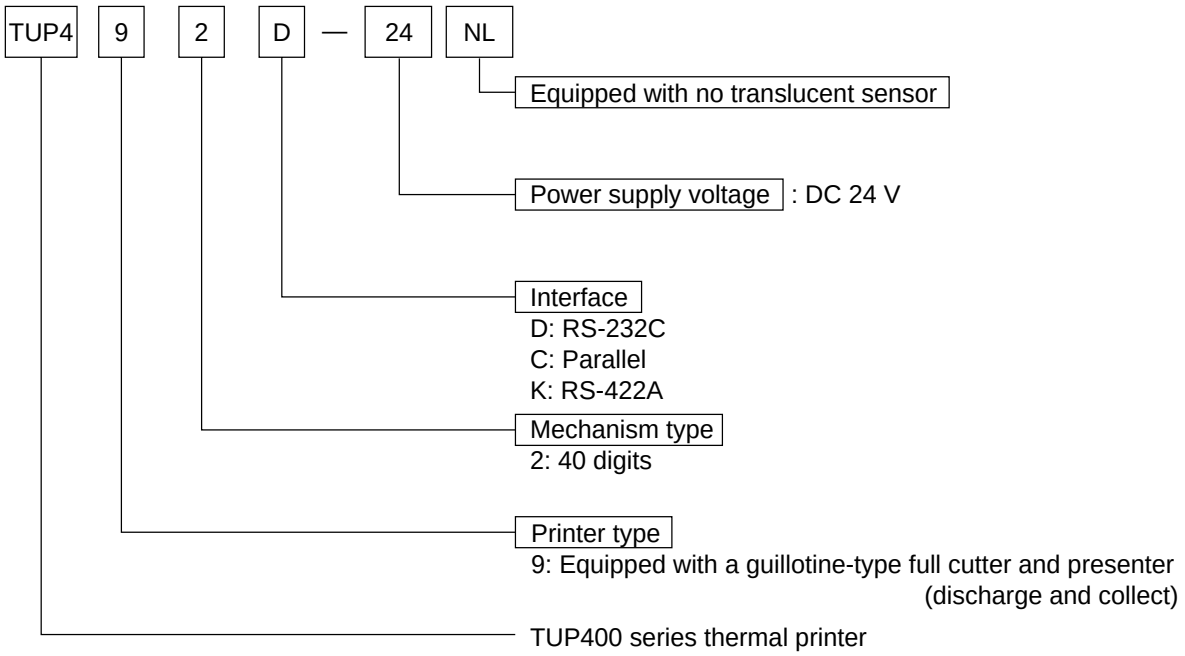
1. GENERAL DESCRIPT

The TUP492-24 printer is a line thermal printer and is used in various electronic equipment, such as game machines, ATMs and information kiosks. TUP492-24 is equipped with a presenter which discharge and collect paper.

These printers feature the following:

1. High-speed printing: 2 in./sec (50 mm/sec)
2. High resolution: 8 dots/mm vertically, 8 dots/mm horizontally (approx. 200 dpi)
3. Silent operation
4. Paper roll size: max. 8-inch diameter
5. Choice of three types of interfaces (optional)
6. Presenter function

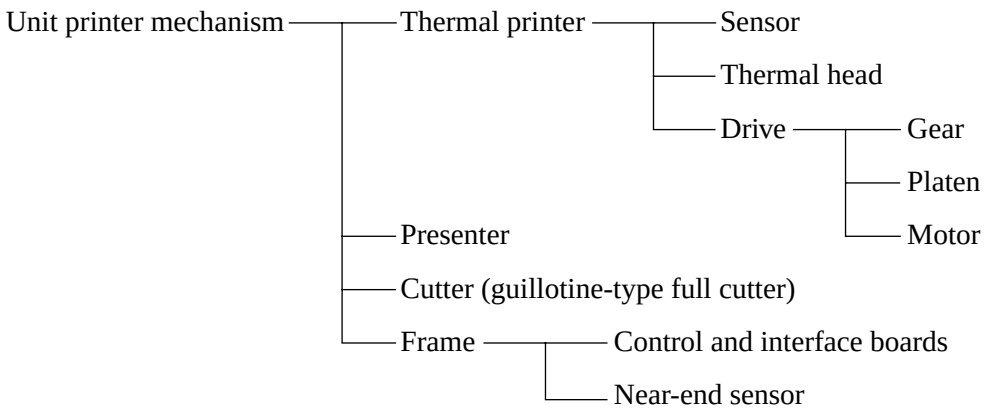
Display of Model Name



2. CONSTRUCTION

2.1 Configuration

The unit printer mechanism is constructed of the following components:



2.2 Principle of Operation

2.2.1 Drive and paper feed

The rotation of the stepping motor is transmitted to the gear, which turns the platen. The rotation of the platen generates friction between it, the thermal paper and the thermal head, therefore causing the paper to be fed.

2.2.2 Printer

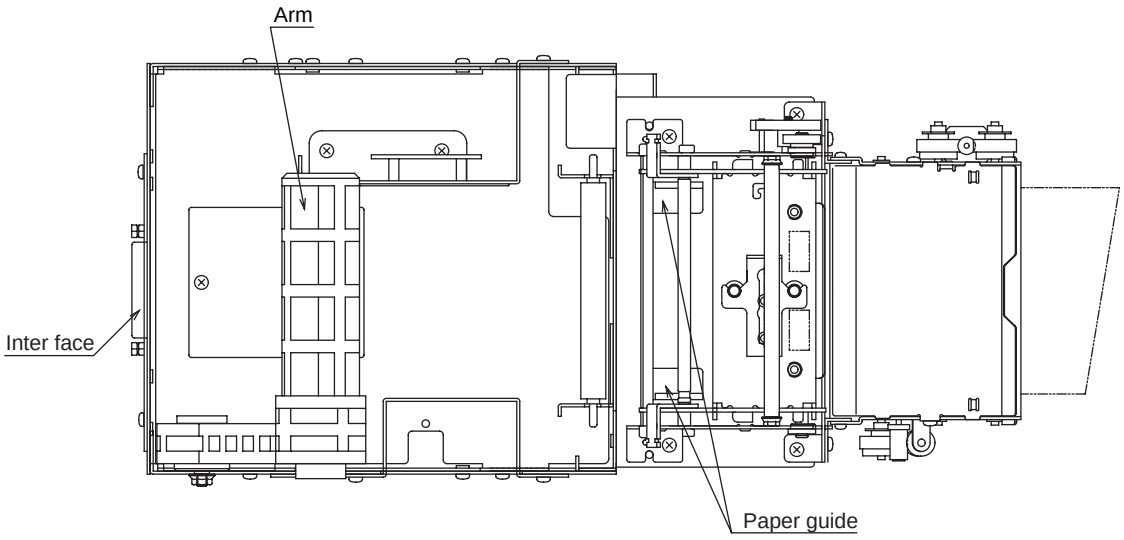
Color appears on the thermal paper as the temperature of the thermal head's heat-generating element increases.

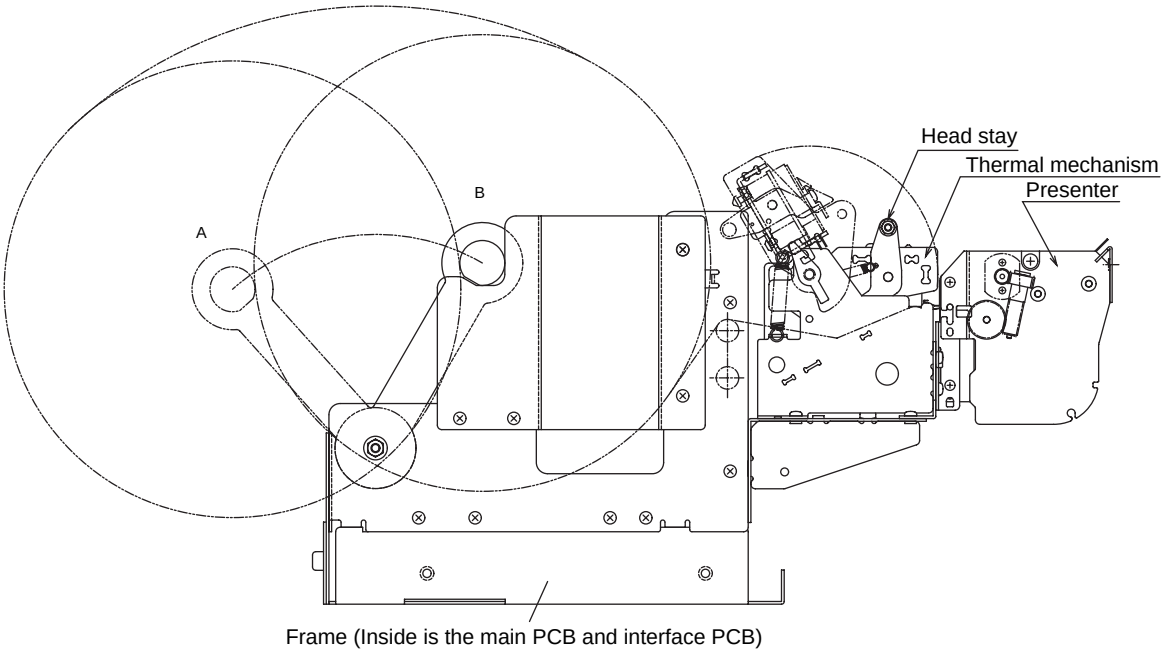
2.2.3 Presenter

The edge of the thermal paper stops just before the presenter's ejector, the continuous feed of the thermal paper creates a loop and after printing is finished, the paper is cut. Then, the paper is fed out by the roller in front of the ejector (The DC motor rotates the roller). Detecting the paper bottom end, the roller stops its rotation.

When the fixed period of time passes, or the collection command is sent, the presenter collects the paper.

Exterior View

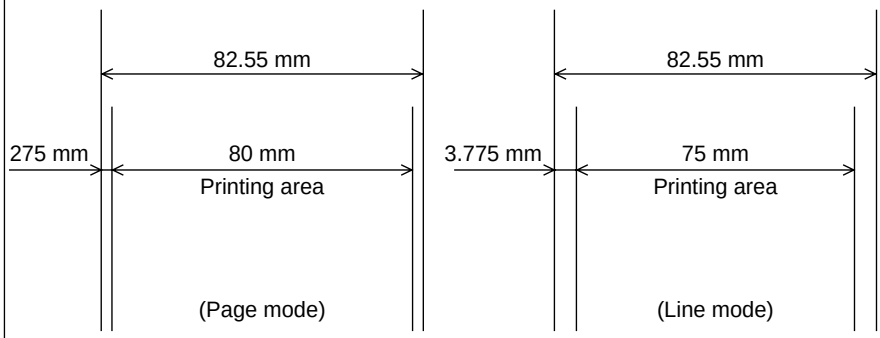
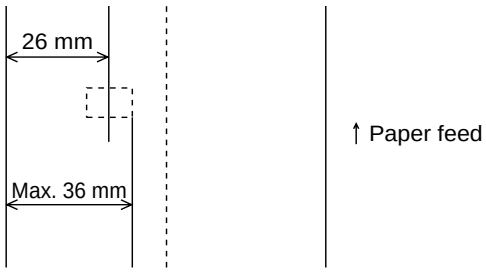




3. GENERAL SPECIFICATIONS

Item	Specification
Printing method	Line thermal direct printing
Printing speed	50 mm/sec, 25 mm/sec
Printing area	80 mm wide (page mode), 75 mm wide (line mode)
Resolution	8 dot/mm (horizontal) 8 dot/mm (vertical)
Paper width	82.55 mm (3.25 in.)
Paper roll diameter	Outer: max. 203 $^{0}_{-2}$ mm (approx. 8 in.) Inner: 32 $^{+1}_{0}$ mm (approx. 1.26 in.)
Characters	ASCII International character set Katakana (Japanese syllabary) Bar code
Paper detection	Paper-out detection using a reflecting photo sensor Black mark detection using a reflecting photo sensor Paper near-end detection using a reflecting photo sensor
Interface	Serial (RS-232C or RS-422A (optional)) Parallel
Data buffer	Approx. 8 KB
Auto cutter	Guillotine-type full cutter
Power supply voltage	DC 24 V ± 7%
Environment	Temperature 5˚C to 40˚C Relative humidity 25% to 80% (no condensation)
External dimensions	173 mm (W) × 355 mm (D) × 175 mm (H) (without paper roll inserted) 173 mm (W) × 382 mm (D) × 254 mm (H) (with 8-in. paper roll inserted)
Weight	Approx. 3.45 kg

4. PAPER ROLL SPECIFICATIONS

Item	Specification
Paper type	Normal heat-sensitive paper
Paper width	$82.55\,^{0}_{-1}$ mm (3.25 in.)
Paper thickness	60 to 100 µm
Core diameter	Inner: $32\,^{+1}_{0}$ mm Outer: $35\,^{+1}_{0}$ mm
Paper type	Nippon Seishi TF50KS-E TF62KS-E Shin Oji Seishi KF-730
Printing area	
Black mark	Printing density Macbeth valve 1.2 or higher Printing position  Printing side Back (opposite to the printed side) Size Width: 10 to 20 mm (center of the paper must be avoided) Length: 3 to 10 mm Reference position The end of the black mark should be positioned at the front in the paper feed direction.

Notes)
- Use paper that is rolled inward.
- Do not affix the end of the paper to the paper roller.
- Paper jams may occur depending on the paper quality used and the pattern printed.
- If the machine is turned off and left for a long time with paper caught in the thermal head, the paper should be removed and inserted again.
- Keep this machine on a level surface.
- The roller may leave short marks in the end of the paper.

5. PRINTER SETTINGS

5.1 Switches and Buttons

The DIP switches and memory switches (EEPROM) are used to make the printer's settings. In addition, the sensor adjusting button and RESUME button, which are not used for making printer settings, are installed.

The sensor adjusting button is located on the paper-out and near-end sensor's PCB (N.EPCB), and is mainly used for adjusting the photo sensors, therefore, it is not used by the general user. The RESUME button is located on the casing (near the LF motor), and is used to bring the printer back on line after it goes off line (e.g. paper-out). For more details about the RESUME button, refer to "6. DISPLAYS AND FUNCTIONS".

The DIP switches are mounted to the interface's PCB and can be changed by operating them from the hole used for replacing the EPROM or by removing the interface's PCB.

The number of DIP switches differs according to the type of interface.

Centronics:	1(4-bit)
RS-232C:	2 (10-bit and 4-bit)
RS-422A:	2 (8-bit and 4-bit)

The EEPROM is 1 word by 16 bits. The EEPROM is mounted on the main unit's PCB and can be changed with the commands.

5.2 Setting the DIP Switches

All of the DIP switches have been set to ON at the time of shipping.

5.2.1 Serial Interface

a) DIP switch 1 (for both RS-232C and RS-422A)

Switch position	Function	ON	OFF
1-1	Baud rate		
1-2			
1-3	Handshaking	DTR	XON/XOFF
1-4	Data length	8 bits	7 bits
1-5	Parity	Disabled	Enabled
1-6	Parity	Odd	Even
1-7	DC1, 3 (*1)	Disabled	Enabled
1-8	Power on (*2)		

*1 Only for the RS-232C (This setting is made with DIP switch 2 on the RS-422A.)
*2 For the power on function

	1-8 ON	1-8 OFF
When DC1, 3 is disabled	Select	Select
When DC1, 3 is enabled	Select	Deselect
When addressable	Deselect	Select

Baud rate	1-1	1-2
2400BPS	OFF	OFF
4800BPS	OFF	ON
9600BPS	ON	ON
19200BPS	ON	OFF

b) DIP switch 2 (only for the RS-422A)

	SW 2-1	SW 2-2	SW 2-3	SW 2-4
DC1, 3 disabled	ON	ON	ON	ON
Address #1	OFF	ON	ON	ON
#2	ON	OFF	ON	ON
#3	OFF	OFF	ON	ON
#4	ON	ON	OFF	ON
#5	OFF	ON	OFF	ON
#6	ON	OFF	OFF	ON
#7	OFF	OFF	OFF	ON
#8	ON	ON	ON	OFF
#9	OFF	ON	ON	OFF
#10	ON	OFF	ON	OFF
#11	OFF	OFF	ON	OFF
#12	ON	ON	OFF	OFF
#13	OFF	ON	OFF	OFF
#14	ON	OFF	OFF	OFF
DC1, 3 mode	OFF	OFF	OFF	OFF

5.2.2 Parallel Interface

Switch position	Function	ON	OFF
1-1	Mode		
1-2			
1-3	Not used		
1-4	Not used		

Mode	1-1	1-2
Compatibility mode	ON	ON
Nibble mode (without negotiation, without termination)	OFF	ON
Byte mode (without negotiation, without termination)	ON	OFF
Not used	OFF	OFF

5.3 Setting the EEPROM

The following command from the host computer is used to make the EEPROM settings.

a) EEPROM settings command

<ESC> #N, n1 n2 n3 n4 <LF> <NUL>

N: Memory switch no.

n1 n2 n3 n4: Setting data

For more details, refer to “Programmer’s Manual”.

b) Memory switch 0

N = 0

n1: Always 0

n2: Always 0

n3: Always 0

n4: Mode select

0	Page mode (Default)
1	Line mode

c) Memory switch 1

N = 1

n1: Sensor select

n2: Start-position detect

n3: Zero style

n4: International character set

Parameter	Setting	0 (Default)	1
n1	Sensor select	Reflective sensor (Black mark)	Transmissive sensor
n2	Start-position detect	OFF	ON
n3	Zero style	Normal zero	Slashed zero
n4	International character set		See below

n4	Country
0	USA
1	France
2	Germany
3	UK
4	Denmark #1
5	Sweden
6	Italy

n4	Country
7	Spain #1
8	Japan
9	Norway
A	Denmark #2
B	Spain #2
C	Latin America

d) Memory switch 2

N = 2

n1: Always 0

n2: Always 1

n3: Always 0

n4: Printing speed

0	50 mm/sec. (Default)
1	25 mm/sec.

e) Memory switch 3

N = 3

n1: Always 0

n2: Character table

0	Normal (Default)
1	Katakana
2	IBM
3	IBM

n3: Print column

0	40 column (Default)
1	50 column

n4:

0	<CR> Disabled	Paper feed 4 mm (Default)
1	<CR> Disabled	Paper feed 3 mm (Default)
2	Same as <LF>	Paper feed 4 mm
3	Same as <LF>	Paper feed 3 mm

f) Memory switch B

N = B

n1: Always 0

n2: Presenter

0	Not installed (TUP452)
1	Installed (TUP482)

n3: Always 0

n4: Always 1

6. DISPLAYS AND FUNCTIONS

The LEDs and RESUME button are mounted on the NEPCB.

6.1 LEDs

LED	Function
HU PE ERR	Lights up when errors occur (For more details, refer to “6.6 Error Messages”.)

6.2 RESUME Button

When no paper is inserted, insert more paper, then press this button to automatically feed the specified length of paper (approx. 80 mm when the presenter is installed or approx. 30 mm when it is not). After the paper is cut, the printer will go back on line.

6.3 Power Switch and Button Combinations

The following settings can be made by pressing either the RESUME button or the sensor adjusting button at the same time that the power switch is turned on.

<RESUME button and power switch>

Buzzer	LED		Function
One beep	HU lights up		
	↓	2 sec.	Release the RESUME button to execute a HEX dump. [*1]
Two beeps	PE lights up		
			Release the RESUME button to execute a test print. [*2]

[*1] The HEX dump mode remains valid until the power is turned off.
[*2] The printer continues the test print until the power is turned off.

<Sensor adjusting button and power switch>

Buzzer	LED		Function
One beep	HU lights up		
	↓	2 sec.	Release the sensor adjusting button to start sensor adjusting mode. [*3]

[*3] Do not continue pressing the sensor adjusting button for more than two seconds.

Note) The Line and Page modes cannot be chosen with the panel buttons; these modes can only be chosen with commands.

6.4 Sensor Adjusting Mode

a) Reflecting sensor (black mark sensor)

- Insert the paper in front of the sensor mechanism so that a black mark is not positioned in front of the sensor.
- Adjust the reflecting sensor controller VR4 on the PCB until the HU LED lights up.

b) Paper-out sensor

- Insert the paper in front of the sensor mechanism so that a black mark is not positioned in front of the sensor.
- Adjust the paper-out sensor controller VR3 on the PCB until the PE LED lights up.

6.5 Near-End Sensor

Selecting the open frame setting with memory switch B enables near-end sensors A and B. It is possible to determine the state of near-end sensors A and B by outputting the <EOT> command to the printer. (This is only possible when a serial interface is used.) Refer to “Programmer’s Manual”.

6.6 Error Messages

It is possible to determine the type of error occurring by observing the printing results and which LED lights up.

a) Recoverable errors

The printer goes off line when these errors occur.

To resume operation, remove the cause of the error, then press the RESUME button.

Error	Cause	LED		
		ERR	HU	PE
Head up error	The head is raised.		On	
Paper-out error	No paper is inserted.			On
Label size error	The paper size differs from the measured size.			On

b) Unrecoverable errors

The printer goes off line when these errors occur.

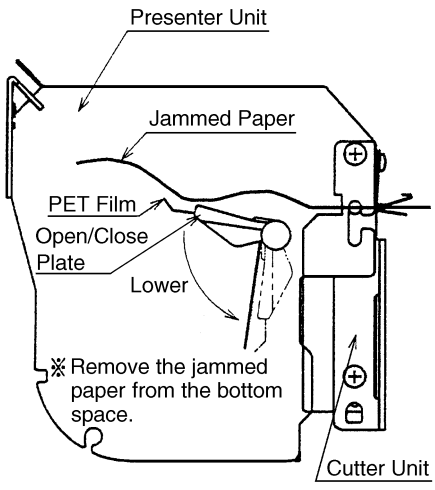
Operation of the printer will be resumed by pressing the resume button after the cause of the unrecoverable error is removed.

Error	Cause	LED		
		ERR	HU	PE
Command error	There is an error in the command.	On		
Cutting error	The paper is not cut properly.	On		On
Transmission error *1	There is an abnormality in the received data.	On	On	
Paper jam error *2	The paper is not fed up to the sensor.	On	On	On

*1 Valid only with the serial interface

*2 If the paper is jamed inside the presenter

① Paper Jam, Case 1: Removing paper from inside the presenter.

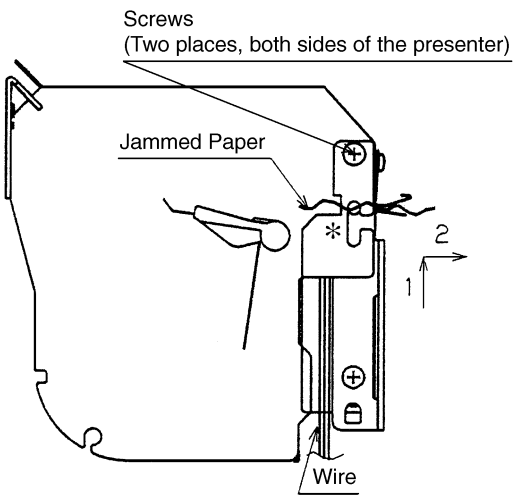


(Procedure)

1) If there is a paper jam at the Open/Close plate, lower the Open/Close plate if it is in the up position. (If it is in the down position, leave it down.)
2) Remove the jammed paper from the space below the presenter unit.

Note) When lowering the Open/Close plate, be careful not to bend the PET film unit.

② Paper Jam, Case 2: Removing paper from near the cutter.



(Procedure)

1) When paper is jammed inside the cutter, if it cannot be removed by the procedure in Case 1, take out the screws on both sides of the presenter, as shown in the figure.
2) Slide the presenter along the * part in the figure, separating the presenter and the cutter, then remove the jammed paper.
3) After removing the jammed paper, slide the presenter back, following the procedure in 2) in reverse order, then fasten it in its original position using the screws.

Note) When fitting the presenter with the cutter in 3) above, be careful not to get the two wires shown in the figure caught between the presenter and cutter.

c) Other errors

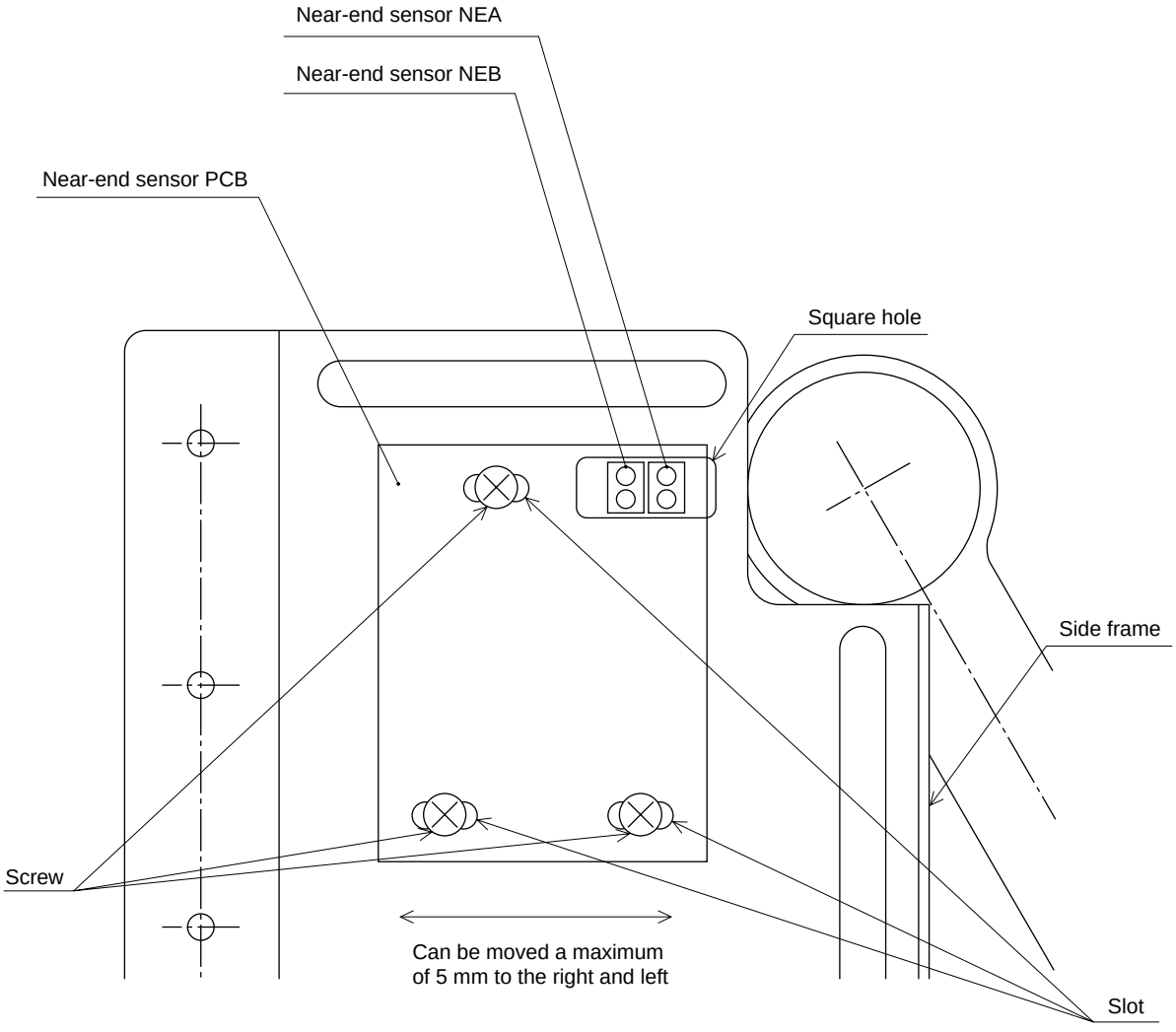
- Data errors (<ESC> “PC” command: defines character and bar code data)
  A data error will occur if an invalid character or bar code type is selected or if the print result extends outside the print area. When a data error occurs, all commands become invalid (character strings and bar codes are not printed). However, the printer will not go off line and the LEDs will not light up.

6.7 Near-End Sensor Position

<Technical Specifications>

The near-end sensors can be moved a maximum of 5 mm to the right or left by moving the near-end sensor PCB.

Slightly loosen the three screws (without removing them) used to install the PCB, then move the PCB to the desired position. After making sure that the PCB fits properly (i.e. it is not loose), tighten the three screws. (Do not break the PCB.)



* The near-end sensors are mounted on the back of the PCB.

7. INTERFACE

Three interface types are available: parallel, serial RS-232C or serial RS-422A. Any of these interfaces can be used by installing the corresponding PCB.

7.1 Serial Interface (RS-232C or RS-422A)

RS-232C

Item	Specification
Data transfer method	Asynchronous serial interface
Data transfer rate	2400, 4800, 9600, 19200 Start bit: 1 Data bit: 7 or 8 Odd, even or no parity Stop bit: 1
Signal polarity	Mark = logic “1” (–3 V to –15 V) Space = logic “0” (+3 V to +15V)

Connector Pin Assignment (D-SUB 25 pin)

Pin No.	Signal Name	IN/OUT	Function
1	F-GND	—	Frame ground
2	TXD	OUT	Transmit data
3	RXD	IN	Receive data
4	RTS	OUT	Send request signal. There is a space when the printer is ready to receive.
5	CTS	IN	There is a space when the host computer is ready to send. However, this signal is not checked by the printer.
6	N/C		Not used
7	S-GND		Signal ground
8 ~ 10	N/C		Not used
11	RCH	OUT	There is a space when the printer is ready to receive. Same as pin 20.
12	N/C		Not used
13	S-GND		Signal ground
14	FAULT	OUT	There is a mark when an error is occurring in the printer.
15	Multi-TXD	OUT	Send data for multi printer
16	Multi-DTX	IN	Receive data for multi printer
17 ~ 19	N/C		Not used
20	DTR		Data terminal ready signal. There is a space when the printer is ready to receive.
21 ~ 25	N/C		Not used

RS-422A

Item	Specification
Data transfer method	Asynchronous serial interface
Data transfer rate	2400, 4800, 9600, 19200 Start bit: 1 Data bit: 7 or 8 Odd, even or no parity Stop bit: 1
Signal polarity	Mark = logic “1” (–) Space = logic “0” (+)

Connector Pin Assignment

Pin No.	Signal Name	IN/OUT	Function
1	F-GND		Frame ground
2 ~ 6	N/C		Not used
7	S-GND		Signal ground
8	N/C		Not used
9	SD (+)	OUT	Send data
10	SD (–)	OUT	Send data
11 ~ 12	N/C		Not used
13	S-GND		Signal ground
14 ~ 16	N/C		Not used
17	RD (+)	IN	Receive data
18	RD (–)	IN	Receive data
19	CS (+)	IN	There is a space when the host computer is ready to send. However, this signal is not checked by the printer.
20 ~ 22	N/C		Not used
23	CS (–)	IN	There is a space when the host computer is ready to send. However, this signal is not checked by the printer.
24	RS (+)	OUT	Send request signal. There is a space when the printer is ready to receive.
25	RS (–)	OUT	Send request signal. There is a space when the printer is ready to receive.

7.2 Parallel Interface

Item	Specification
Method	Centronics
Data transfer rate	1000 to 6000 cps
Synchronization method	External supply strobe pulse
Handshaking	By $\overline{\text{ACK}}$ and BUSY signals
Logic level	TTL-compatible

Connector Pin Assignment

Pin No.	Signal Name	IN/OUT	Function
1	$\overline{\text{STROBE}}$	IN	Normally HIGH. Data reading starts after this signal becomes LOW.
2 ~ 9	DATA 1 ~ 8	IN	Data. HIGH for “1”, LOW for “0”.
10	$\overline{\text{ACK}}$	OUT	Turned ON when data acquisition is complete.
11	BUSY	OUT	Reception of data is possible when this signal is LOW; reception is not possible when HIGH.
12	PAPER OUT	OUT	Becomes HIGH when no paper is inserted.
13	SELECTED	OUT	Becomes HIGH when the printer goes on line.
14 ~ 15	N/C		Not used
16	SIGNAL GND		Signal ground
17	CHASSIS GND		Printer frame ground
18	+5 V		+5 V for external equipment (50 mA max.)
19 ~ 30	TWISTED PAIR RETURN		Return signal for various signals
31	$\overline{\text{RESET}}$	IN	Initializes the printer when LOW.
32	$\overline{\text{ERROR}}$	OUT	Becomes LOW when the printer cannot function.
33	EXT GND		Ground terminal for external equipment
34 ~ 35	N/C		Not used
36	—		Always HIGH

8. CUTTER

Item	Specification
Method	Guillotine-type full cutting
Drive method	DC motor
Installation	Attached to the mechanism with screws
Supply	Thickness of one sheet of paper: 60 to 100 μm
Minimum cutting length	25.4 mm (no presenter) 80 mm (equipped with presenter)
Life (standard paper)	300,000 times Paper debris must be removed.
Error	An error occurs if the cutter has not returned to the home position within the specified time.

Notes) If the cutter is not located at the home position when an error has occurred, it can be returned to the home position by removing the cause of the error and turning the power off, then on again.

The cutter can also be returned to the home position by turning off the power, inserting a screwdriver into the hole on the side of the cutter, then rotating the motor until the cutter is returned to the position which is believed to be the home position.

9. PRESENTER

Item	Specification
Possible sheet length	Approx. 80 mm (min.) Approx. 300 mm (max.)
Operation sequence (viewed from the operator's side)	a. The paper is not ejected during printing. b. The cutter cuts the end of the paper after printing is completed. c. The presenter's roller rotates for 5 seconds, which causes the sheet to be ejected from the exit. The sheet stops when the end leaves the roller. d. The next printing step starts when the sheet is removed by the operator. e. If the sheet is not removed within 5 seconds, the roll begins to rotate. If the status end request (EOT) is sent from the host computer while the sheet is remains at the exit, the host computer will return to status E5.

10. CHARACTERS

10.1 Character Set

ASCII

Katakana (Japanese syllabary)

International character set

10.2 Characters and Sizes

(Width and length of 1 dot = 0.125 mm (1/8 mm))

1. Page mode

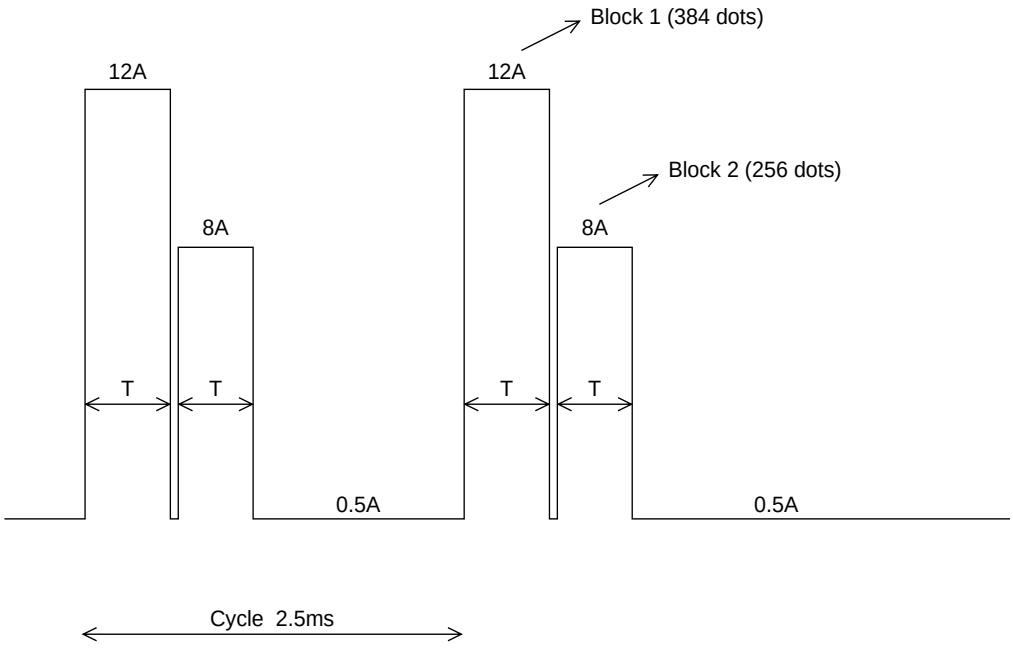
Character face	Print size (length × width)
Small characters	16 × 8 dots
Standard characters	24 × 16 dots
Bold characters	32 × 24 dots
OCR-B	24 × 16 dots
Full-size Kanji	24 × 24 dots

2. Line mode

Character face	Print size (length × width)
IBM Block	24 × 12 or 32 × 12 dots
Other ANK	24 × 12 dots
Full-size Kanji	24 × 24 dots
Half-size Kanji	24 × 12 dots

11. POWER REQUIREMENTS

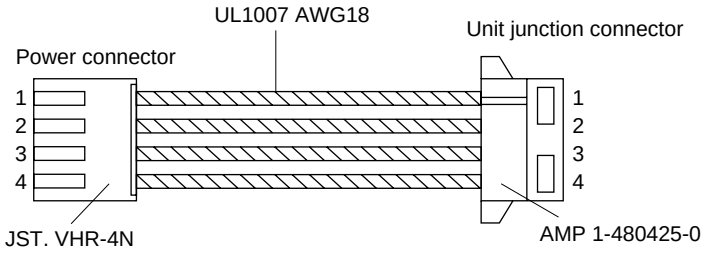
The input voltage shall be DC 24 V ± 7% (rated 2.5 A, less than 6 A/15 sec.). The current used when solid printing is performed is shown below.



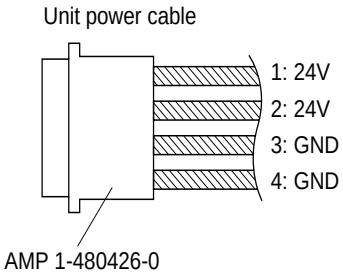
Item	Specification
T (weld time)	approx. 550 ms (25˚C, standard density) Max. 800 ms depending on the conditions
Current (during solid printing)	Peak current: 12 A max. Average current: 6.6 A max.

$$\frac{12 \times 0.8 + 8 \times 0.8 + 0.5 \times (2.5 - 0.8 \times 2)}{2.5}$$

Item	Specification	
Recommended power supply	For 100 or 120 V	Star Micronics Power Supply Unit SLS-060P-50 (Part number: 87393030)
	For 230 V	Star Micronics Power Supply Unit SLS060PH-50A (Part number: 87393090)



Recommended power – unit junction cable



12. NOISE

Item	Specification
Measurement standard = ANSI	1.29 (DIN45, ISO7779)
Average sound pressure at 1 m	50 dB or less

13. STANDARDS

Safety standards

1. UL (RU)
2. CSA

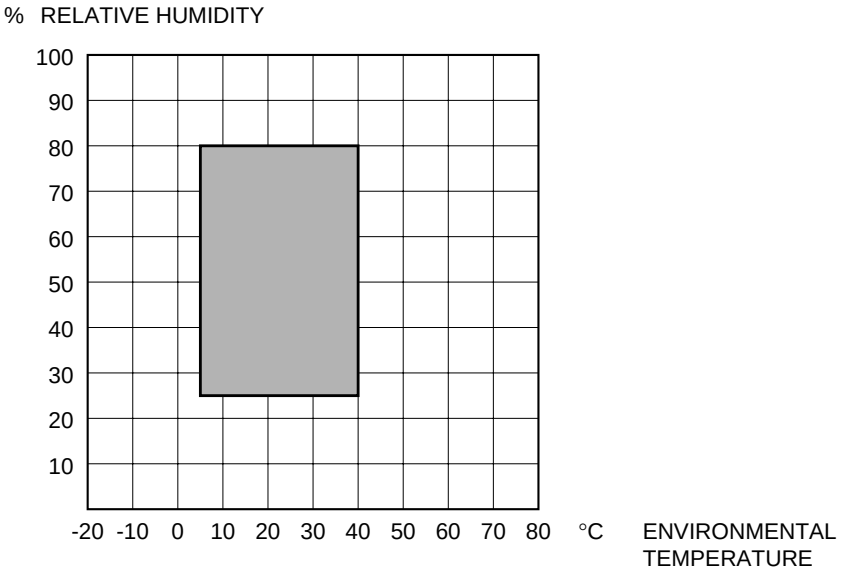
14. RELIABILITY

14.1 During operation

Temperature: 5˚ ~ 40˚C

Humidity: 25% RH ~ 80% RH (no condensation)

Operating temperature and humidity ranges



Notes) When the environmental temperature is too high, the thermal head temperature sensor is activated and the printer stops operating.

14.2 During storage

Temperature: –20˚C ~ 60˚C

Humidity: 10% RH ~ 90% RH (no condensation)

14.3 Allowable Static Electricity Level

		Quality control test specifications
Direct discharge	Element allowable level (self-printing)	± 8 kV (*1)
	No fracturing of elements allowed	± 15 kV
Indirect discharge	Element allowable level (self-printing)	± 15 kV
	Checker connection allowable level (continuous printing)	± 3 kV (*2)

Direct discharge error: ≤5%
Indirect discharge error: 0%

(*1) ±10 kV test is also performed.
(*2) ±5 kV test is also performed.

Notes)
- Use SLS-060P-50 (Sanken) as the power source.
- The reference data is shown in the table above; this data may differ depending on the installation conditions.

14.4 Vibration Test

Item	Specification
Frequency	7 ~ 100 ~ 7 Hz (sweeping: 2.5 minutes)
Amplitude	15.3 ~ 0.07 mm
Gravity	1.5 G (constant)
Vibration direction and time	1 hour in each direction: X, Y and Z Total of 3 hours
Packing	As small as possible

14.5 Drop Test

Item	Specification
Drop height	80 cm
Drop sequence	One corner, three edges and six surfaces
Packing	As small as possible

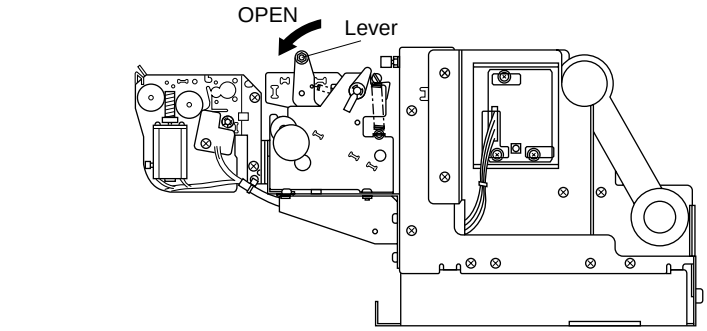
14.6 Life Test

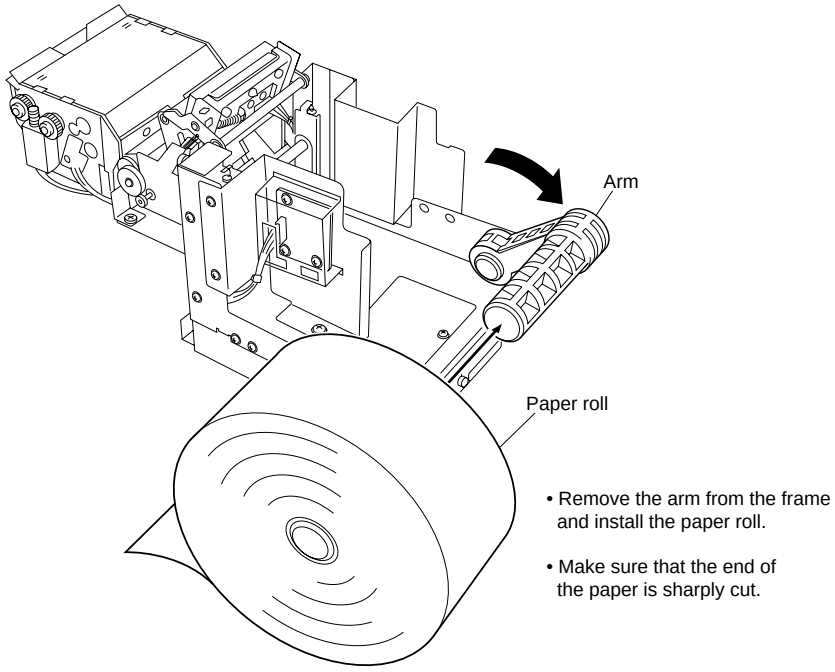
MCBF

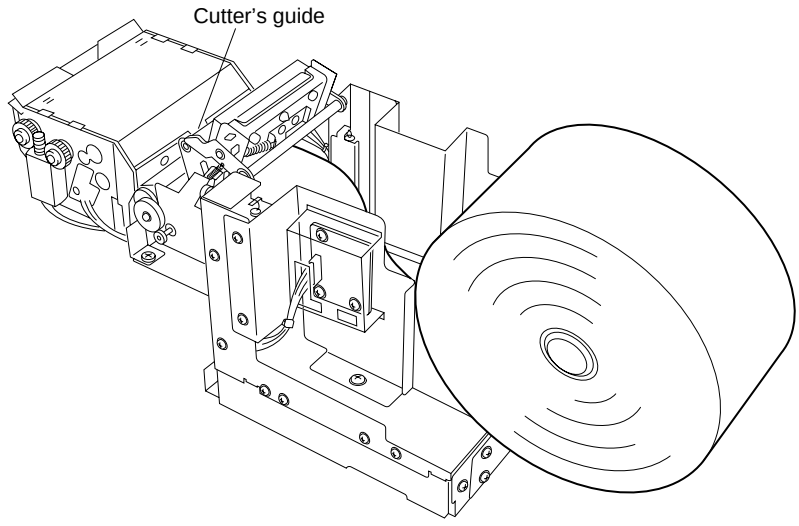
Item	Specification
No. of printed lines	5 million lines (excluding the thermal head life)
Auto cutter	300,000 cutting operations (One sheet of paper should be less than 85 μm.)
Thermal head	5×10^7 pulses or a printing distance of 30 km

Notes)
- The thermal head life given above is applicable for cases when standard paper is used.
- Printing continuously at a print ratio of less than 12.5% increases the resistance of the thermal head's heat-generating element by more than 15% of the initial value.
- Excluding damages caused by dust, foreign objects etc.
- Missing dot ratio maximum of 0.5% over 50 km.

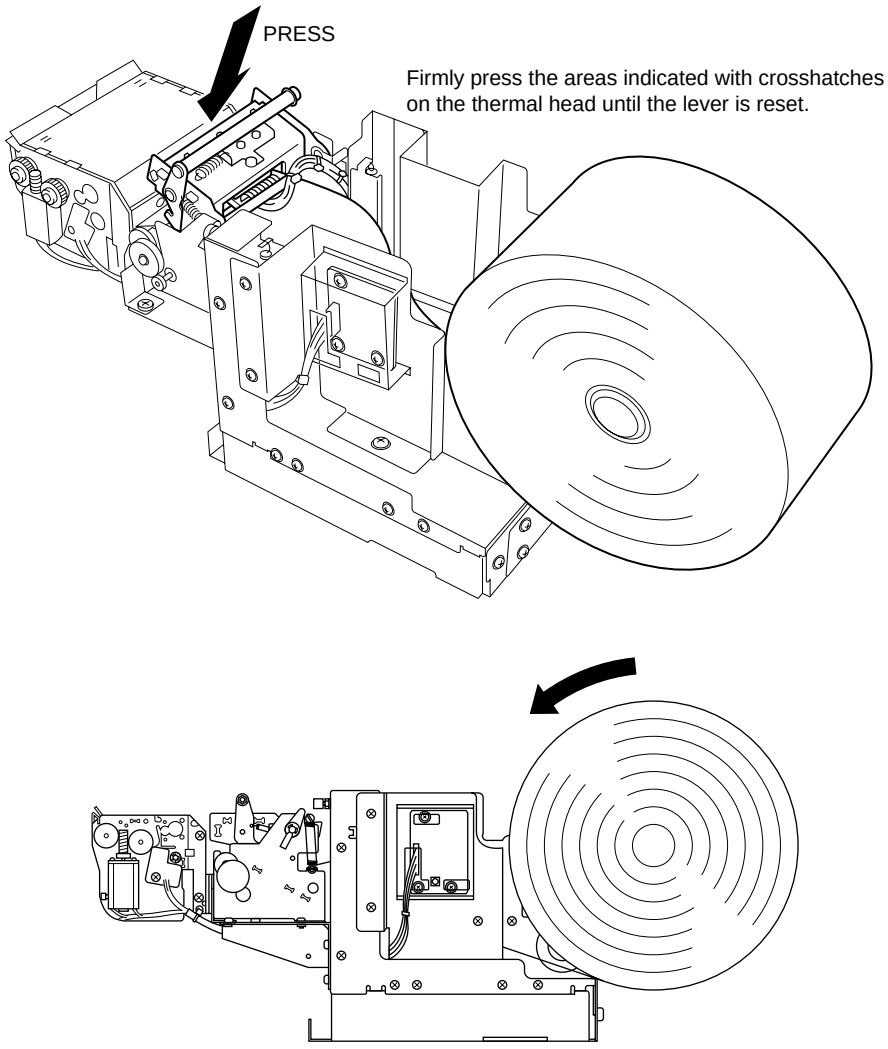
15. INSTALLING THE PAPER ROLL



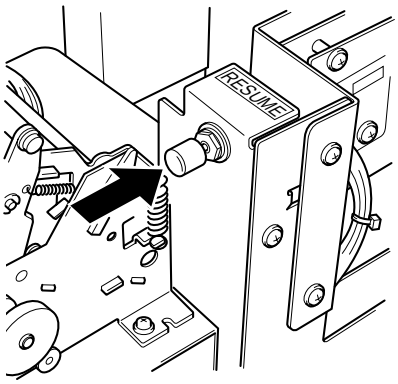




Pass the paper over the damper shaft, pass it under the thermal head, then insert the paper between cutter guides. Double check that the paper is inserted into the cutter by looking into the small wholes on the upper cutter guide. Feed the paper until the end enters the presenter's roller.



Carefully place the paper roll on the frame, then wind the roll to remove any slack in the paper. (Incorrectly installing the paper roll may bend the frame or cause a paper jam.)

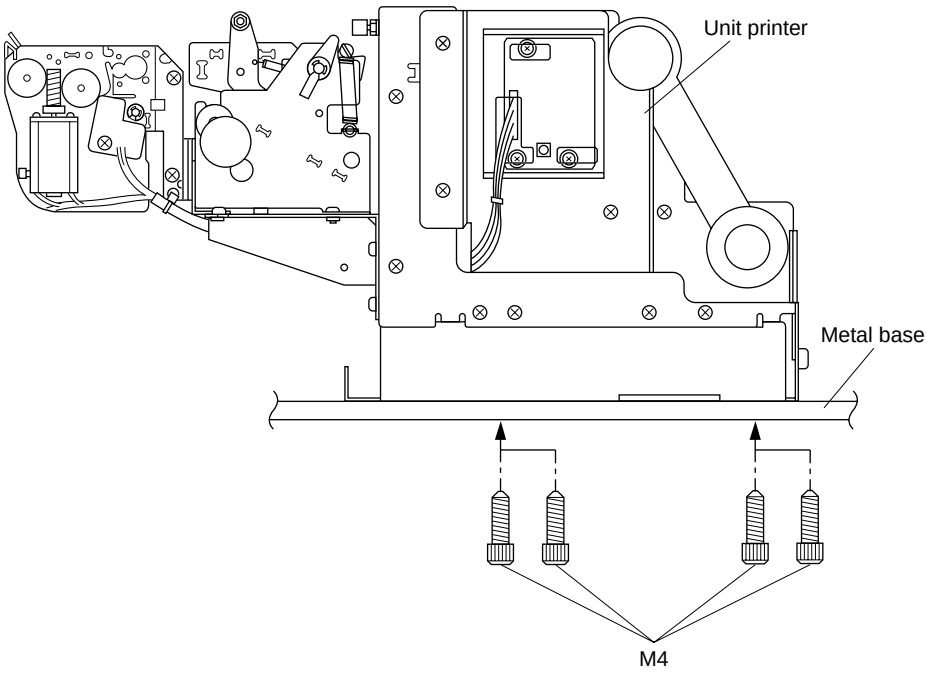


Press the RESUME button.

16. INSTALLATION

Installation procedure

Install the printer using four M4 bolts as shown in the illustration below. (Refer to the diagram of the “Installation Hole Dimensions”.)

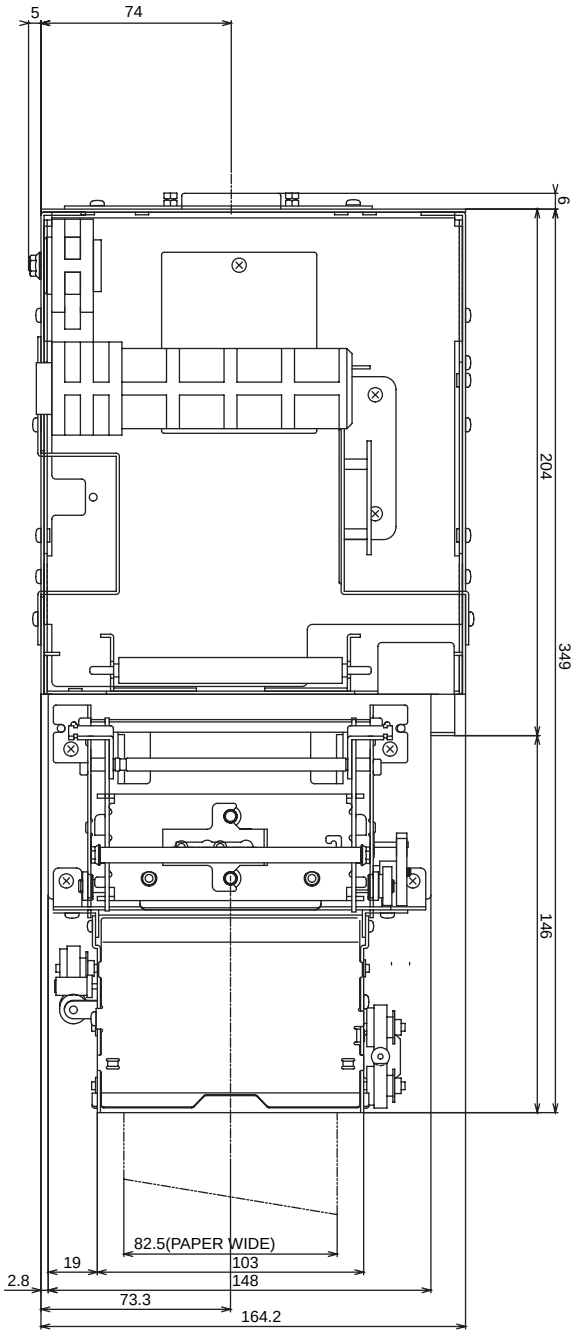


16.1 Installation precautions

1. Install the printer on a level surface. (Consult with a representative when installing the printer at an angle.)
2. Be sure that there is plenty of space around the printer. (Refer to the diagram of the “External Dimensions”.)
3. Since the thermal head is very hot, carefully examine where the printer is installed. (When a fan is used to provide ventilation, be very careful of dust since it can damage the thermal head.)
4. Although this printer is made of plated steel sheets, the ends are not plated.

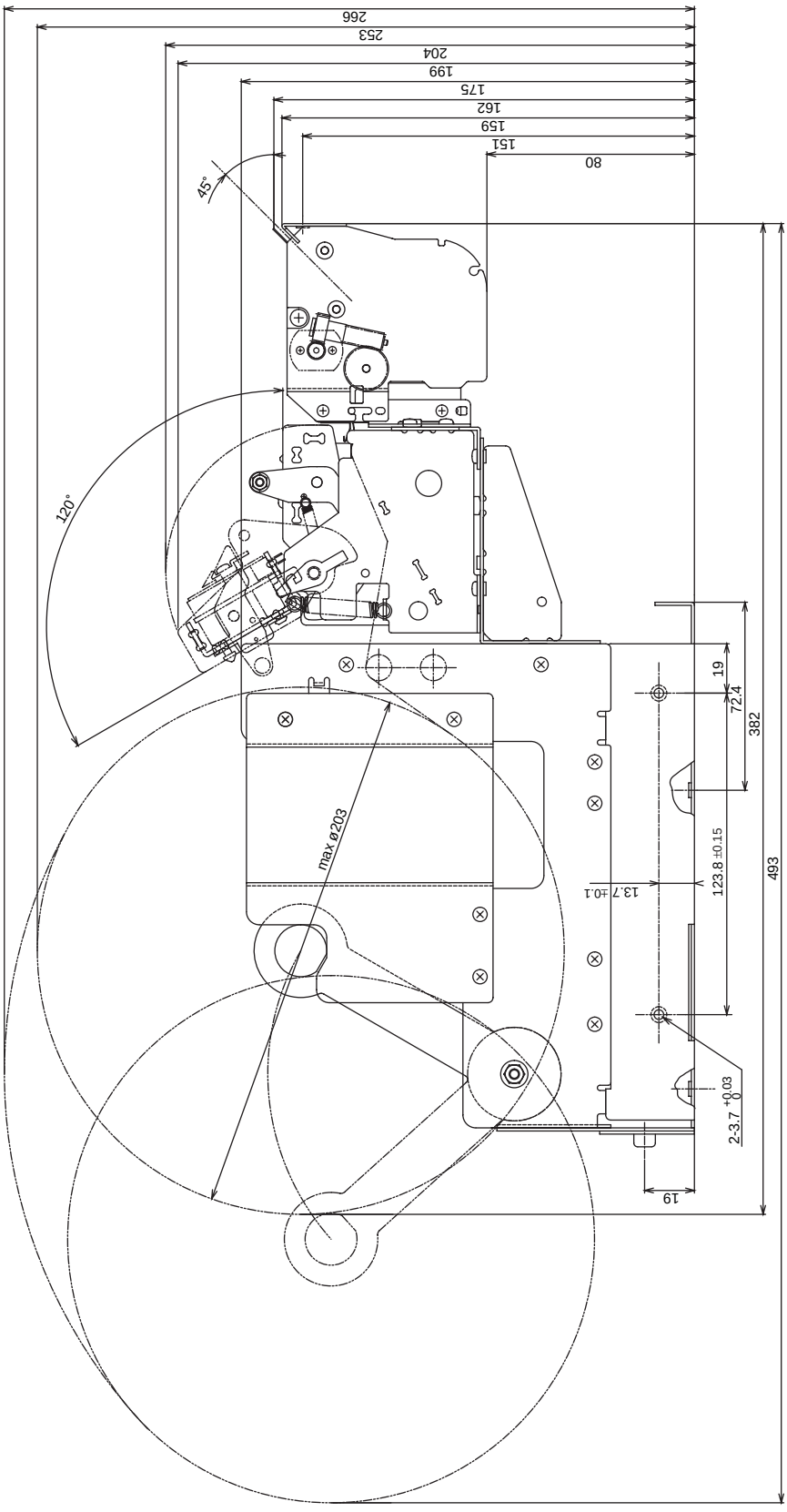
16.2 Other precautions

1. Correctly insert the paper before printing.
2. Do not use or store this printer in a dusty or oily environment or in a place containing a large amount of iron.
3. Remove any dust, paper particles, etc. using either a soft brush or a cloth dampened in alcohol.
4. Do not apply a strong force to the printer. Otherwise, the frame may bend causing the printer to malfunction.
5. The printer should only be used in the specified environmental conditions (temperature, humidity, etc.) and not subject to sudden environmental changes. When sudden environmental changes occur, the printer should be kept in the new environment for approximately 30 minutes before it is used.
6. Do not use the printer if condensation has formed on it.



(Unit: mm)

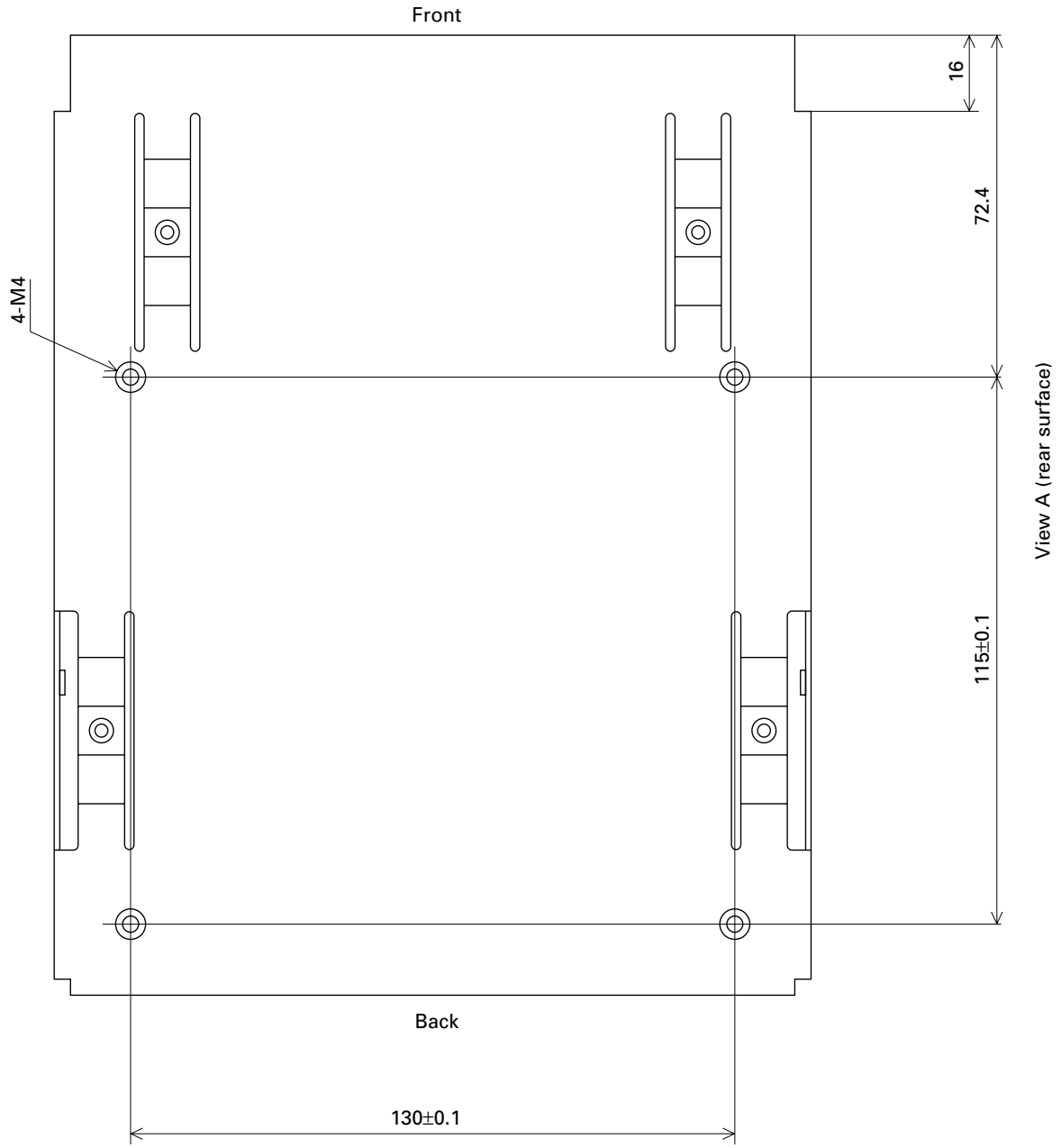
External Dimensions


266
253
204
199
175
162
159
151
80
45°
120°
max ø203
19
72.4
382
123.8 ±0.15
13.7 +0.1
493
2-3.7 +0.03 0
19

(Unit: mm)

Installation Hole Dimensions

Using four M4 bolts, install the printer from the bottom as shown in the illustration below.



(Unit: mm)

17. MAINTENANCE

Regular maintenance is very important since minute debris of thermosensible paper sticking to the platen may cause slipping of the paper feeder. Maintenance should be made as follows:

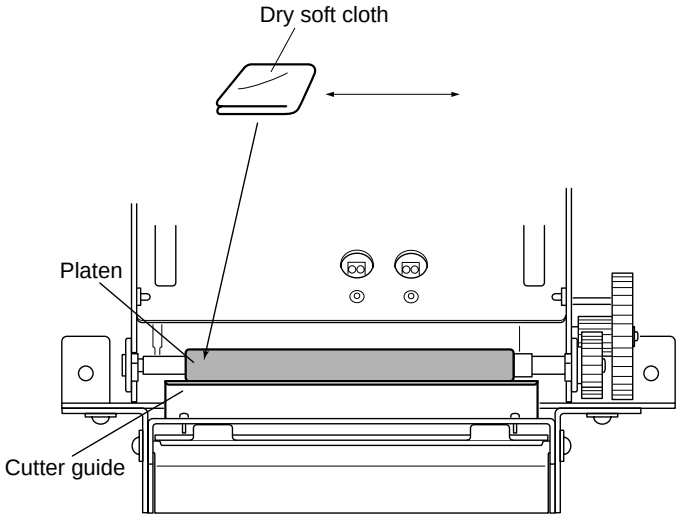
Maintenance Timing:

Generally, TUP series should be maintained every time after using 8 rolls of 8 inch ø Star Standard Spec paper roll, or 6 month.

Maintenance Procedures:

1. Make sure that the power supply is turned off before starting the maintenance procedures.
2. Wipe and rub the platen gently with a dry soft cloth to remove all debris stuck on the platen surface. (Turn the platen around to remove debris from all the surface.)

* Take enough care not to touch the gears and the cutter guide when wiping the platen to avoid any bodily injury.
* Avoid wiping a same spot of the platen continuously, otherwise it may cause deformation of the platen.
* Wash your hands thoroughly before touching the platen.



3. Remove the dirt from the thermal head using a cotton bud or soft cloth dipped in alcohol.
4. Remove all dirt, dust or paper debris, etc. adhering to the sensors (particularly the reflector type sensors) of the thermal mechanism and the presenter.

   Note) For the presenter's paper sensor, take out the screws in the presenter cover on the side as shown in the figure below, remove the cover, then remove the dust from above. Also, after maintenance, return the presenter cover to its original position and fasten it with the screws which were taken out before.